CDW CONSULTANTS, INC.

CIVIL & ENVIRONMENTAL ENGINEERS

PRINCIPALS AND ASSOCIATE
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John Goodhall, P.E.

PHASE I PRELIMINARY SITE ASSESSMENT RELATIVE TO OIL AND HAZARDOUS MATERIALS

Concord Carlisle High School
500 Walden Street
Concord, MA

May 2011

Prepared for:

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CDW Project #1234

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I. PRELIMINARY PHASE I SITE ASSESSMENT SUMMARY

CDW Consultants, Inc. (CDW) has conducted an investigation of the Concord Carlisle High School located at 500 Walden Street ("Site") in Concord, Massachusetts. The investigation consisted of a Site reconnaissance, document research of the Site to identify potential environmental concerns, an environmental database review and interviews with local officials, the current Site owner, and agency employees. This Site investigation was conducted in April and May, 2011.

1.0 General Site Conditions

1.1 Location and Site Description

The subject Site is located at 500 Walden Street, Concord, Massachusetts and consists of the Concord-Carlisle High School. Additional facilities, the Beede Swim and Fitness Center and school bus transportation facility, are also within the campus but are outside of the scope of this assessment. The campus is comprised of a parcel of land that totals approximately 94 acres and is located on the Town of Concord Assessor's Map 11H, Block 298. The campus is located on the United States Geological Survey (USGS) Concord, MA (1987) Quadrangle Map (Refer to Figure 1 in Appendix A for the Locus Map) at approximate UTM coordinates 307325.4 mN, 4702042.0 mE and latitude 42° 265' 55.3'' N, longitude 71° 20' 34.4'' W. Figure 2 in Appendix A is an Assessor's map showing the property limits.

On April 21, 2011, CDW performed a Site reconnaissance to observe the interior of the existing building, general surficial condition of the Site, and documented existing and observable land uses of the Site and adjacent properties. The interior inspection was conducted in the presence of custodian Chris Johnson. Mr. Steve Wall, Building Supervisor, was also interviewed.

1.2 Interior Building Inspection

The Concord-Carlisle Regional High School is a one and two story brick and concrete flat roof structure that was build in 1959. The gymnasium, auditorium, and library are located in the two story section of the building.

The high school services students grades 9-12, and houses classrooms, offices, bathrooms, storage closets, custodian closets, boiler room, mechanical room, gymnasium, auditorium, library, cafeteria, kitchen, and maintenance department. Laboratory chemicals for the science classrooms were observed in a locked central storage room. A flammable storage cabinet and an acid storage cabinet were also observed in the storage room. The visual arts classrooms (including photography and ceramics) and the woodworking classroom were not accessible. Potential hazardous materials associated with those subjects, such as film developing chemicals, ceramic glazes, paints, etc., may be stored in those classrooms. The bathrooms have floor drains that discharge to the sewer system. The custodial rooms have small quantities of cleaning products.

Mr. Steve Wall provided access to the kitchen for observation. There are two walk in freezers and one walk in refrigerator, as well as floor drains and a grease trap that discharge to the sewer system. Mr. Wall stated that the school is hooked up to public water and public sewer. The grease traps are regularly cleaned, however he did not indicate when the last cleaning occurred.

The maintenance department has a concrete floor and exterior bay door to allow for vehicle and landscaping equipment access and maintenance. Small quantities of automotive chemicals and lubricants are stored on shelves and a 5 gallon gasoline container is stored on the floor. The concrete floor has minor cracking and oil stains. No floor drains were observed.

The boiler room located near the gymnasium is below grade and has a concrete floor. Two natural gas fired boilers, one air compressor, air handling units for the HVAC system, two wall mounted and one floor mounted dry transformers, and electrical panels were observed. The concrete floor was in relatively good condition, with no observable cracks. Two floor drains were observed with no liquid and appear to be plugged. There were minor oil stains and oil absorbent material observed under the air compressor.

The mechanical room located in the math/science wing is below grade and has a concrete floor, which is in good condition with no observable cracks. Two sumps, an air handling unit, dry transformer, one floor drain, and crawl space pipe chase were observed. One sump contained water, with no oily sheen observed. The second sump was no longer in use, dry, and had no oil staining. The floor drain was dry and no staining was observed around the drain. Access to a crawl space with a dirt floor was observed that contained piping.

The mechanical room located near the auditorium is below grade and has a concrete floor, which is in good condition with no observable cracks. A chiller unit, compressor, sump, and two floor drains were observed. The floor drains were dry and appear to be plugged. The sump contained water of which no oily sheen was observed. Minor oil stains on the concrete floor were observed underneath the compressor.

Mr. Johnson had no information on the discharge locations of the floor drains in the boiler room and mechanical rooms.

1.3 Exterior Building Inspection

The parcel of land that the Site is located within is bounded by wetlands and residential housing on the northeast, by residential housing on the southeast, by State Highway Route 2 and an active railroad operated by MBCR on the southwest, and by a wooded area and residential housing on the northwest. The Site is accessed by two paved driveways that connect to Walden Street and Thoreau Street. Stormwater catch basins were observed in these driveways.

Improvements to the Site include the high school building, two temporary buildings that house classrooms, grassed landscaped areas, asphalt paved access roads and parking lots. Outside of the subject Site and scope of this assessment are the Beede Swim and Fitness facility, school bus transportation facility, athletic fields, tennis courts, and wooded areas.

A paved loop drive is located in front of the main entrance to the building with a grassed area within the loop. There is also a paved access road that encircles the school building. Stormwater catch basins were observed in these access roads.

To the west and down slope of the school building are the school athletic fields, with a paved access road leading to the fields. To the south of the building are steep grassed slopes and beyond are tennis courts and a wooded area. Stemming south from the access road that encircles the school building is a paved access road to the recreational turf field parking lot and a paved access road leading to the school bus transportation facility. Both are up slope of the school building.

In front of bay doors on the southern side of the building is a concrete pad. Mr. Wall stated that a waste oil UST was removed from this location in 1998. No fill port or staining was observed to suggest that there is a UST currently being used. Additional information regarding USTs for the Site is found in Section 4.0. To the east of the building is asphalt paved parking.

There are three courtyards, two partially and one fully surrounded by the building. The fully surrounded courtyard has a man-made pond and shed that is used as a teaching tool. The other courtyards have grassed landscaped areas, walk ways and benches. Catch basins were observed in these courtyards.

Two back up generators, with sub-base diesel storage tanks, on concrete pads were observed; one outside of the cable television room and the other outside of the computer room. Both are surrounded by a chain link fence. No rust or staining was observed on the surface of the generators and there was no distressed vegetation surrounding the generators. The natural gas meter was observed on the southeast side of the building. A solid waste trash dumpster and recycling carts were located on a paved area at the southern side of the building. No evidence of inappropriate dumping was observed.

There was no evidence of suspect waste disposal pits or areas of oil staining observed during the Site inspection. Additionally, there were no areas of disturbed soil or distressed vegetation, or monitoring wells observed on the exterior of the Site.

2.0 Additional Site and Surrounding Area Information

2.1 Massachusetts GIS Data

The following is additional research pertaining to the Site that was conducted using the Massachusetts Geographical Information System (MassGIS) online data viewer.

Hydrography

According to the MADEP Wetlands and USGS data layers, there are wetlands present immediately adjacent to the north side of the athletic fields. There are wetlands located across Walden Street, to the east of the subject parcel. Located with a ½ mile of the Site is Fairy Land Pond to the east and Walden Pond to the south. (Figure 3 in Appendix A).

Open Space

The MassGIS open space data layer shows that a portion of the Site is open space that is owned by the Town of Concord for recreation and has a limited level of protection. Additionally, there are four parcels of open space adjacent to the Site, located to the east, north, west, and south (Figure 4 in Appendix A). The following parcels are:

Name	Owner	Purpose	Level of Protection
Hapgood Wright Forest	Municipal	Conservation	In Perpetuity
Emerson Playground	Municipal	Recreation	None
Arena Farmland	Municipal	Conservation	In Perpetuity
Walden Pond State Reservation	State	Conservation	In Perpetuity

Natural Heritage Atlas

A review of the 13th Edition of the Massachusetts Natural Heritage Atlas data layer shows that there is a Priority Habitat of Rare Species within a one-half mile south of the Site. There are no Areas of Critical Environmental Concern (ACECs) at the Site or within a one-half mile radius of the Site. (Figure 5 Appendix A).

Resource Areas

The MassGIS regulated areas data layers (Figure 6 Appendix A) show that within a one-half mile radius of the Site there is a MADEP Permitted Solid Waste Facility to southeast; there are three Certified Vernal Pools, one to the east and two to the south; and public water supply groundwater wells to the north. Additionally, the Site does lie within an area classified as a medium yield aquifer and Public Water Supply Protection Area Zone II. There are no Massachusetts Contingency Plan (MCP or Chapter 21E) sites within the one-half mile radius.

2.2 Physical Setting

According to the USGS Topographic Map, the Site is located at an elevation of 154 feet mean vertical datum. The entire Site is steeply sloped. The groundwater flow direction is estimated to be towards the north but could also be influenced by local wetlands and water bodies.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (Panel 25017C0378E), the Site is located within a Zone X, which is classified as an area outside of the 0.2% annual chance floodplain (Figure 7 Appendix A).

CDW did not perform any subsurface investigations as part of this Preliminary Phase I. According to the U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS), the Site soil component is predominantly Urban Land (Udorthents), which may include very deep, nearly level to moderately steep, loamy and sandy soils that have been altered. The surrounding soil types are steeply sloped sandy-loam or loamy-sand soils and include Hinckley loamy sand (15-25% slopes), Windsor loamy sand (3-8% and 8-15% slopes), and Merrimac fine sandy loam (3-8% slopes).

CDW reviewed the Bedrock Geologic Map of Massachusetts (Zen, 1983). The bedrock beneath the Site is "SOagr" that is part of the Avalon Belt, which consists of muscovite-biotite granite.

The storm water on the site collects in catch basins. According to Mr. Steven Ventresca of Nitsche Engineering, there are two storm drain systems on the Site. One storm drain system is located along the access road off Walden Street and discharges directly to an outfall in the wetland across Walden Street. The other storm drain system is located along the access road off Thoreau Street and discharges directly to an outfall on Town property across Thoreau Street.

3.0 Site and Surrounding Area History

CDW reviewed available aerial photographs and records at local and state agencies and the local historic archives, and conducted interviews for information regarding historical uses of the Site and surrounding area.

According to the Concord Assessor's Department, the current owner of the Site is the Town of Concord. The school building was built in 1959. There is no Sanborn Fire Insurance Map for this Site.

CDW reviewed aerial photographs of the Site and surrounding area dated 1938, 1952, 1960, 1969, 1978, 1980, 1985, 1995 and 2006. The 1938 aerial photograph of the Site shows an access road leading to disturbed areas. To the north of the Site is agricultural land and to the west wooded areas to the south and east. The 1952 aerial photograph of the Site shows that area of disturbance increased. The 1960 aerial photograph shows the newly constructed high school building and athletic fields. From the 1960s through to 2006, the aerial photographs show single family homes constructed on the once agricultural land to the north and west of the Site. The wooded areas to the south and east continued to remain undeveloped and are now protected open space. The 1952, 1969, 1980 and 2006 aerials are provided in Appendix B.

CDW reviewed historic maps that are archived at the Concord Free Public Library. An 1830 map of Concord depicts the Site as wooded hills with only one house to the east. An 1852 map of Concord depicts the Site as woodland and the newly constructed Fitchburg Railroad. The 1942 Planning Board map of Concord shows the newly constructed State Highway Route 2 to the south of the Site.

CDW interviewed Ms. Leslie Wilson, Curator of the Concord Free Public Library Special Collections, regarding the history of the Site. Ms. Wilson provided oral history of the possible historic uses of the Site. According to Ms. Wilson, a gravel pit occupied the site during the 1920s. Additionally she stated that the town dump was also located on this property. She provided a photo dated 1936 of the intersection of Walden and Thoreau Streets that included the "old town dump" in the caption of the photo.

4.0 Records Review

CDW reviewed records from various local and state offices, and obtained an environmental database report from Environmental Data Resources, Inc. (EDR) for information pertaining to the Site and the surrounding area. The Site is listed on the FINDS and MANIFEST databases. The Site is not listed as a leaking underground storage tank (LUST) site, RELEASE site (MA Release Tracking Database), and SHWS site (database of releases of oil and hazardous materials to MA DEP) as a federal National Priority List (NPL), Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) site, Resource Conservation and Recovery Act (RCRA) corrective action report, large or small quantity generator or transporter. Also the Site is not listed as a Federal Emergency Response Notification System (ERNS) site, or above ground storage tank (AST) site. The EDR Report Executive Summary is provided in Appendix C. A summary of the information follows.

4.1 Registered Underground Storage Tank (UST)

CDW reviewed the state database for registered USTs. According to the MassDEP database (as of April 2011), there are no currently registered USTs on the Site, however there was one (1) registered UST located at the Site that was removed in 1998. The UST was a 275 gallon steel tank that contained waste oil.

4.2 Massachusetts SHWS List

CDW reviewed the SHWS database published by the MassDEP (April 2011), which contains information on releases of oil and hazardous materials that have been reported to the MassDEP. According to the MassDEP, there are no State Listed Reportable Releases on the Site or within a ½ mile of the Site.

4.3 Massachusetts Leaking Underground Storage Tanks (LUST)

CDW reviewed this database published by the DEP (April 2011) that document releases with one or more underground storage tank(s) as the source of contamination. The subject Site is not listed as a LUST and there are no LUST sites within a ½ mile of the Site.

4.4 Massachusetts Leaking Aboveground Storage Tanks (LAST)

CDW reviewed this database published by the DEP (April 2011) that document releases with one or more above ground storage tank(s) as the source of contamination. The subject Site is not listed as a LAST and there are no LAST sites within a ½ mile of the Site.

4.5 RCRA Hazardous Waste Generators List

The subject site is not listed as a Resource Conservation and Recovery Act (RCRA) Generator. There are no RCRA generators located within one mile of the Site.

4.6 Massachusetts Solid Waste Facilities (SWF) List

CDW reviewed this database published by the DEP (April 2011) which indicated that there is one (1) solid waste facility currently located within ½ mile of the Site. The land fill is closed with required monitoring. The land fill operated from 1959 – 2000.

Site Name	Address	Direction	Distance
Concord Landfill	755 Walden St	S-SE	.47 miles

4.7 U.S. EPA Brownfield Lists

The subject Site is not listed as a United States Environmental Protection Agency Brownfield Site. The EDR Report does not list any Brownfield sites within one mile of the Site.

4.8 National Priority List (NPL)

The subject Site is not listed as a NPL site. The EDR Report does not identify any NPL sites within one mile of the Site.

4.9 CERCLA Sites

The subject Site is not listed as a CERCLA site. The EDR Report does not identify any CERCLA sites within one mile of the Site.

4.10 Other Databases

FINDS (Facility Index System)
The Site is listed under Registry ID: 110036623801. The EDR Report describes this database as Environmental Interest/Information System from the National Center for Education Statistics, the primary entity responsible for collecting and analyzing data pertaining to education in the United States. The Site is listed because it is a school.

MANIFEST
The Site is listed under EPA I.D. MAP000067938. The EDR Report describes this database as the NY Manifest tracking database for hazardous waste shipments. The Site is listed for a one-time shipment of 7 pounds of D003 – Nonlisted Reactive Wastes on 8/18/1992.

4.11 Fire Department Records

On April 25, 2011, CDW reviewed all available records for the subject Site at the Concord Fire Department. A photocopy of FP-290R Notification and a report on the "Removal of Underground Storage Tanks Concord Public Schools and Concord-Carlisle Regional High School" (Attachment D) were obtained. The following records were reviewed:

- Permit FP-290 Part 3: 5,000 gallon aboveground storage tank (AST) at the bus transportation facility for the storage of diesel fuel. Dated 10/17/1998.

- Permit FP-290R: Notification of Removal of a 275 gallon waste oil tank dated 12/14/1998.

- "Report on the Removal of Underground Storage Tanks Concord Public Schools and Concord-Carlisle Regional High School", written by Gemini Geotechnical Associates, Inc. and dated 8/31/1990. The report included the removal and environmental review of three USTs that were removed from the Concord-Carlisle Regional High School. According to the report, two 15,000 gallon and one 10,000 gallon USTs were removed from the Site on July 17 and 18, 1990. All three tanks contained #4 fuel oil. The soils were analyzed for volatile organic compounds and total petroleum hydrocarbon. Results indicated that the soils were not contaminated and were used to backfill the excavation. The report stated that the tanks were satisfactorily removed in compliance with all applicable local and state laws.

No additional permits or closure reports were found at the fire department.

4.12 Building Department Records

On April 25, 2011, CDW reviewed the records of the Concord Building Department and obtained access to all available records pertaining to the subject Site.

The following records were reviewed:

- Original construction plans of the Concord-Carlisle Regional High School indicated the school originally used a septic system. Septic Tank A was adjacent and south of the access road off Walden Street. Septic Tank B was west of the physical education wing of the school. No information was shown on the location(s) of the leach fields.
- Massachusetts ANF-001 Form – Asbestos Abatement Notification forms for the Concord-Carlisle Regional High School for the following years: 1988, 1993, and 2007.
- MassDEP Notice of Noncompliance, January 31, 2002, for accumulating old, unusable laboratory chemicals.

4.13 Water and Sewer Department Records

On April 25, 2011, CDW interviewed the clerk at the Concord Water and Sewer Department regarding the subject Site. She confirmed that the Concord-Carlisle Regional High School is connected to public water and public sewer. No information about when the school connected to public sewer or history of the septic system was available.

4.14 Planning Division and Historical Commission

On May 9, 2011, CDW interviewed Ms. Marcia Rasmussen, Director of the Planning Division and Historical Commission. Ms. Rasmussen stated that a gravel pit operated at the site during the 1920s and then Site was used as the town dump. Furthermore, Ms. Rasmussen contacted Mr. Jim Macone, whose family owned the gravel pit. Mr. Macone stated that the "Macone pit" and then the town dump were located at the site of the current student parking lot.

CDW was also provided records that pertained to the construction of athletic fields located on the subject parcel. A letter from the Massachusetts Historical Commission to the Secretary of Energy and Environmental Affairs, dated May 30, 2007, determined that "the portion of the woods slated for the playing fields is not of great value as an historic landscape since it already has been significantly disturbed" and that "no archaeological site is identified within or proximate to the boundaries of the site of the proposed playing fields."

A report on the "History of the Concord-Carlisle Regional High School Woods" by Mr. Richard O'Connor, 2007, was also reviewed (Excerpts from this report are in Appendix E). This report was presented to the Concord Historical Commission on May 30, 2007. The high school woods are located adjacent and south of the Site. The report indicated that the eastern portion of the current high school lot was used as a gravel-removing operation during the 1920s. Additionally, the report indicated that town dump was located on the subject parcel up through the 1950s. The report also included hand sketched maps depicting the property ownership from the 1800s to 1970s, and showed the location of the town dump and present day high school building in the same proximate area.

II. FINDINGS AND RECOMMENDATIONS

CDW Consultants, Inc. is providing our professional opinions, based upon our findings as detailed in the "Phase I Preliminary Site Assessment Summary." In addition, we have summarized the key observations and findings upon which these opinions are based.

From this study, CDW has made the following observations:

- The subject Site is located on a Town-owned parcel of land totaling approximately 94 acres. The Site occupies a portion of that parcel, and is improved with a one and two-story brick and concrete high school building (Concord-Carlisle Regional High School). The remainder of the Site is occupied by paved parking and vehicle access roadways, athletic fields, and landscaped and wooded areas as well as the school bus transportation facility and Beede Swim and Fitness Center.

- The school building was constructed in 1959. Historic documentation identified prior uses to include a gravel/sand pit and town dump.

- According to the Concord Fire Department, three (3) USTs that contained heating fuel oil were removed in 1990 and the 1 UST that contained waste oil was removed in 1998.

- The Site is not identified as a DEP Waste Disposal Site. No NPL sites and no current CERCLA listed sites are located within one mile of the Site. The Site is not listed as a RCRA small quantity generator of hazardous waste.

Based upon CDW's observations, there was no visible evidence of releases of oil or hazardous materials at the Site. Based upon the Site research conducted, there exist recognized environmental conditions at the Site which include:

- Documented use of the Site as a sand/gravel pit and the Town dump up until the 1950s.

- The possible presence of contaminated subsurface soil or groundwater due to former USTs, disposal into former septic system leaching fields, and/or undocumented discharges from sumps and floor drains.

- Possible subsurface impacts from undocumented on-site disposal of various waste oils, oil based paints, chemicals and solvents associated with laboratories and classrooms.

No conclusions or opinions can be made regarding the subsurface conditions at the Site without the completion of soil and groundwater sampling and analysis. CDW recommends the following to further investigate the environmental condition of the Site:

- CDW recommends that a Phase II subsurface investigation be conducted including the installation of monitoring wells, and comprehensive soil and groundwater analysis. The wells should be installed in areas to investigate the possible presence of contaminants from former uses, USTs, floor drains, sump and floor drain outlets, and septic system leach fields.

- The results of the soil and groundwater testing program should be compared with applicable standards under the Massachusetts Contingency Plan for notification and/or mitigation requirements. The outcome of the initial sampling efforts can be used to determine whether further investigation and/or remediation is warranted to mitigate potential environmental impacts prior to or during construction.

- During any excavation of the subsurface, if any suspect oil or hazardous materials are encountered, CDW recommends that an environmental consultant observe the excavation to determine whether conditions require mitigating measures prior to new construction.

III. LIMITATIONS

The conclusion is limited to the information available at the time of the investigation and the scope of services as defined. No subsurface exploration was performed on this Site; therefore, no conclusions can be made relative to subsurface conditions or the presence of soil or groundwater contamination from either on-site or off-site sources. In addition, where access to portions of the Site or to structures on the Site was unavailable or limited, CDW renders no opinion as to the presence of oil or hazardous material or the presence of indirect evidence related to oil or hazardous material in that portion of the Site or structure. No other conclusions, interpretations, or recommendations are contained or implied in this report other than those expressed. Also, CDW makes no warranty, expressed or implied, on the accuracy of the work and information completed by others and upon which CDW has relied to prepare this report. No other use of this report is warranted without the written consent of CDW Consultants, Inc.

IV. REFERENCES

1. Bedrock Geologic Map of Massachusetts, 1983.
2. Concord, Board of Assessor's, GIS Map Review, April 25, 2011.
3. Concord, Building Departments, Records Review, April 25, 2011.
4. Concord Fire Department, File Review, April 25, 2011.
5. Concord, Planning Division and Historical Commission, File Review, May 9, 2011.
6. Environmental Data Resources, Radius Map Report, April 15, 2011.
7. Environmental Data Resources, Sanborn Map Report, April 15, 2011.
8. Environmental Data Resources, Aerial Photo Report, April 15, 2011.
9. Johnson, Chris, Custodian, Concord-Carlisle Regional High School, April 21, 2011.
10. Massachusetts Department of Environmental Protection, Searchable Site List April 2011.
11. Massachusetts GIS Online Data Viewer, April 2011.
12. O'Connor, Richard. "History of the Concord-Carlisle Regional High School Woods" - 2007
13. Wall, Steve, Building Supervisor, Concord-Carlisle Regional High School, April 21, 2011.
14. Wilson, Leslie, Curator, Special Collection, Concord Free Public Library, May 9, 2011.
15. United States Geological Survey, Concord, MA Topographic Quadrangle. 1987.

APPENDIX A

Figures

CDW CONSULTANTS, INC.

SITE

CONCORD CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00
SCALE: 1:20,000

FIGURE 1

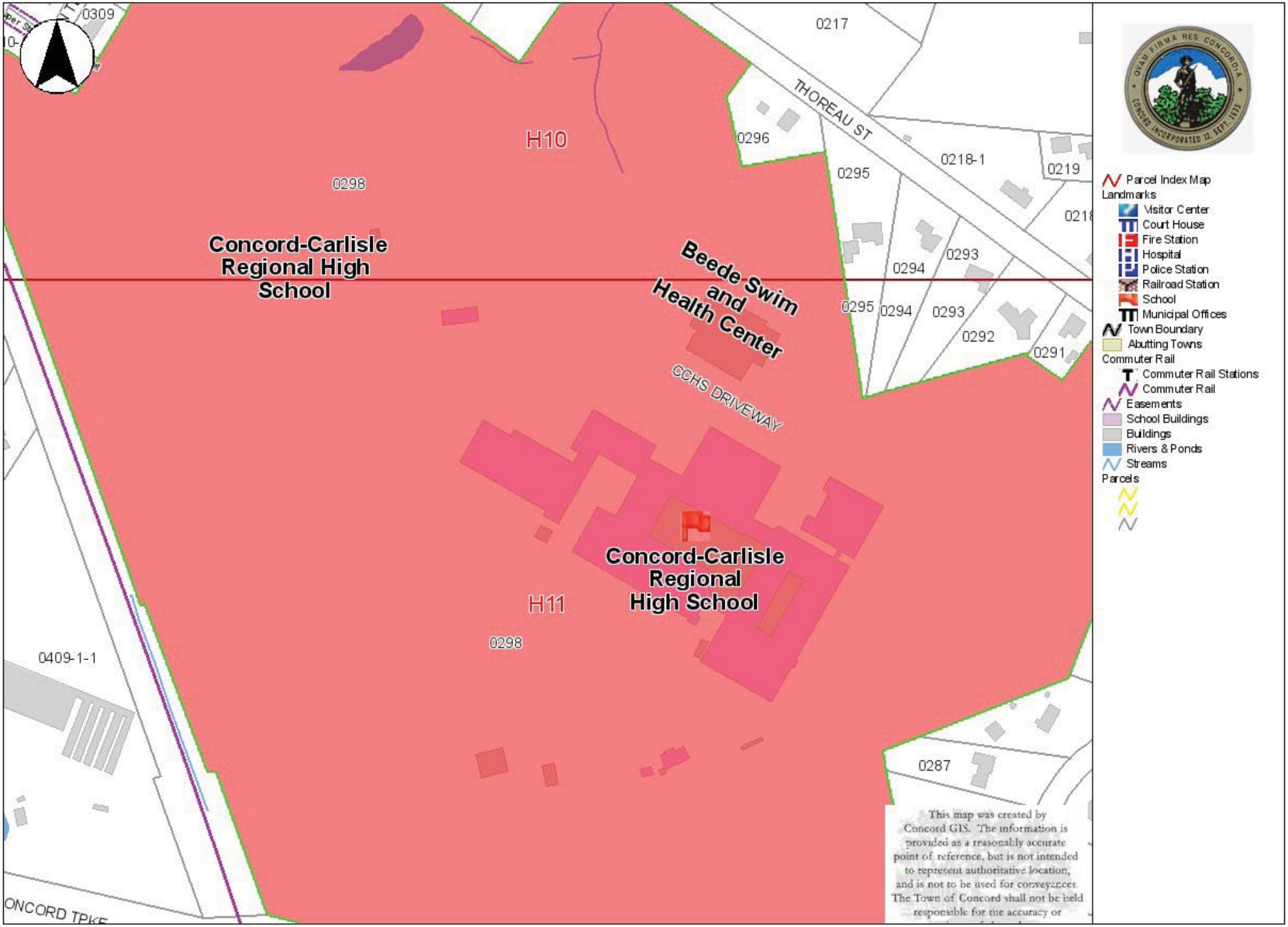
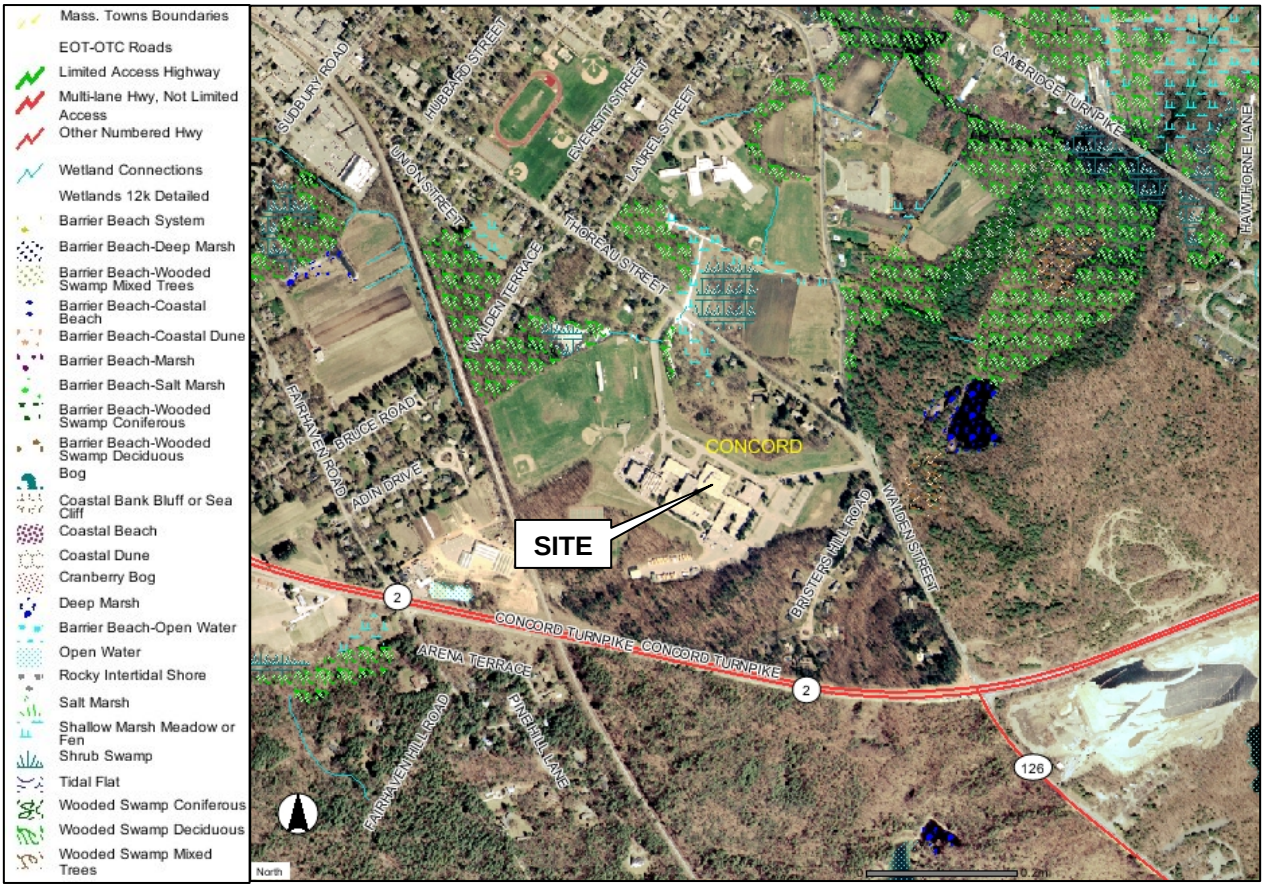


FIGURE 2

MapsOnline



CDW CONSULTANTS, INC.

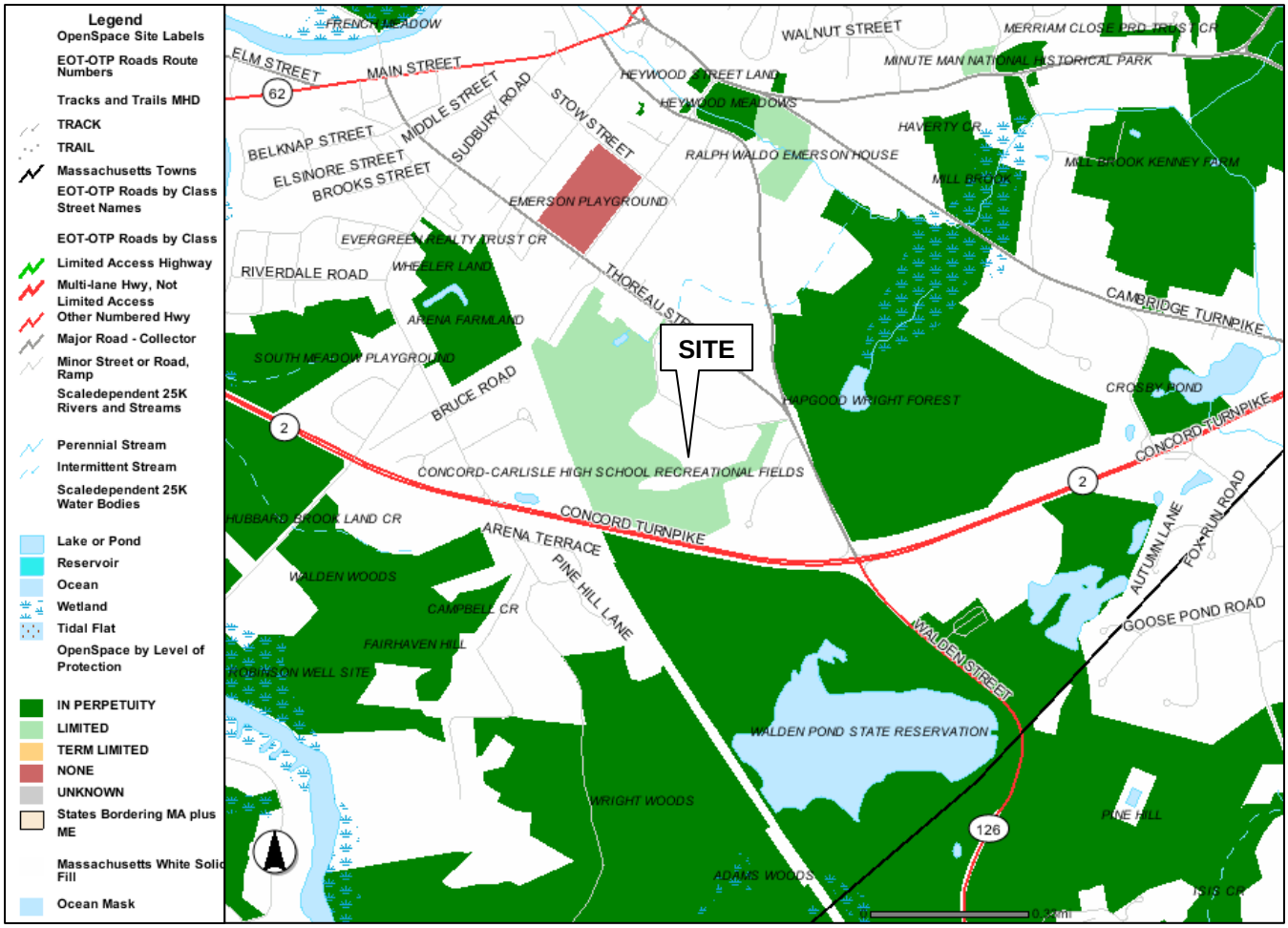
HYDROGRAPHY

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00

FIGURE 3



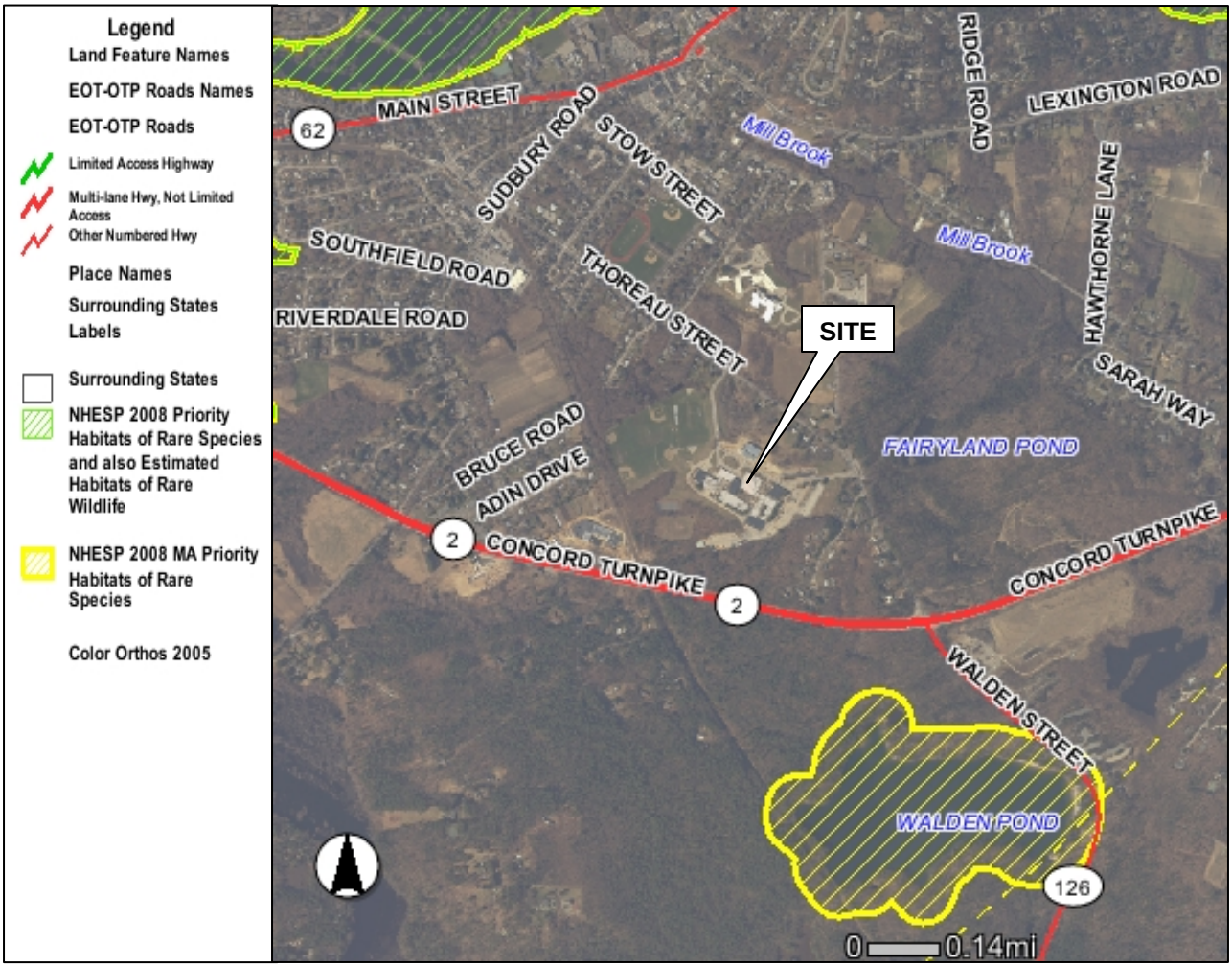
CDW CONSULTANTS, INC.

OPEN SPACE

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA PROJECT NO.: 1234.00

FIGURE 4



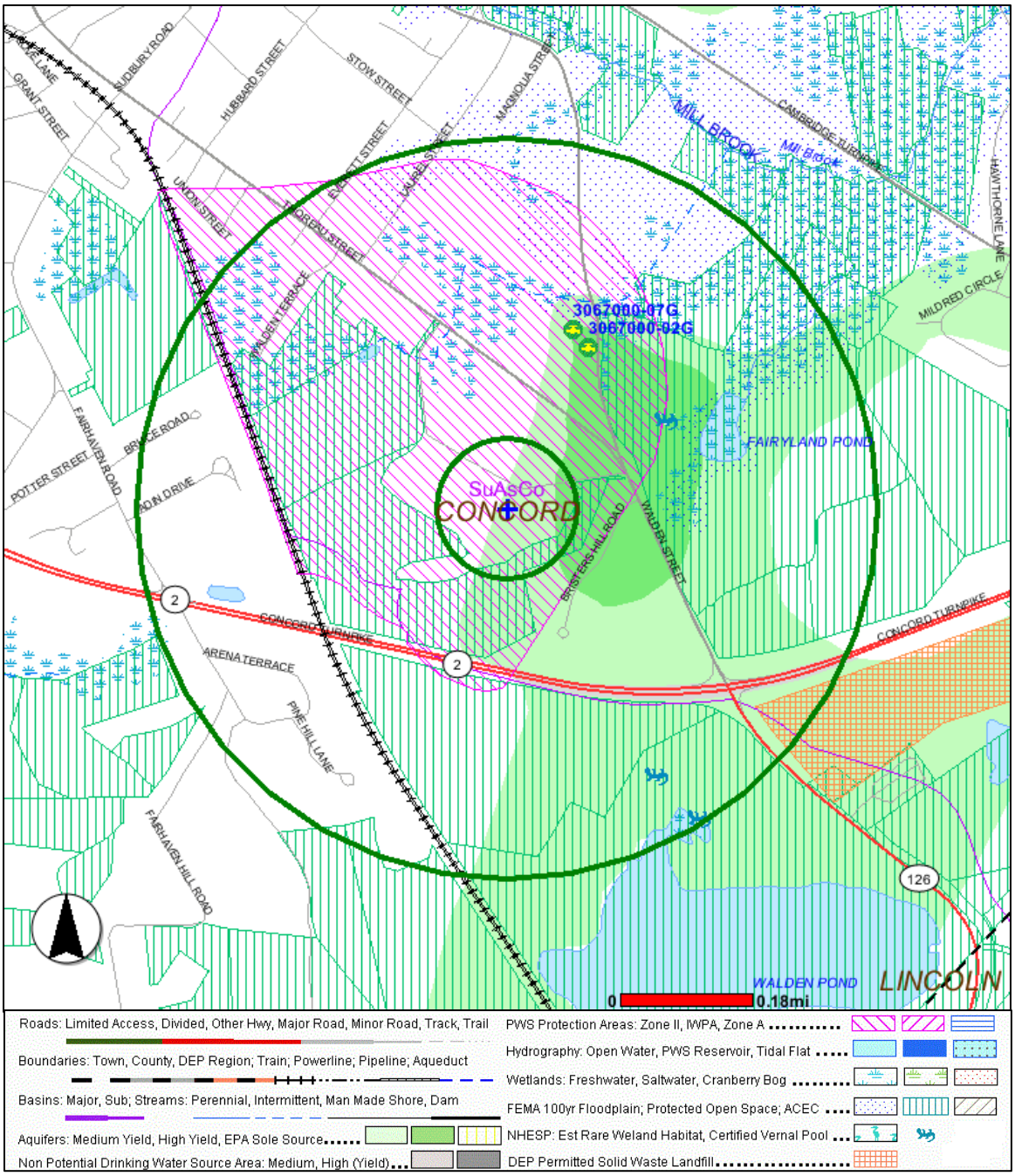
CDW CONSULTANTS, INC.

NATURAL HERITAGE ATLAS

CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA PROJECT NO.: 1234.00

FIGURE 5



CDW CONSULTANTS, INC.

RESOURCE AREAS

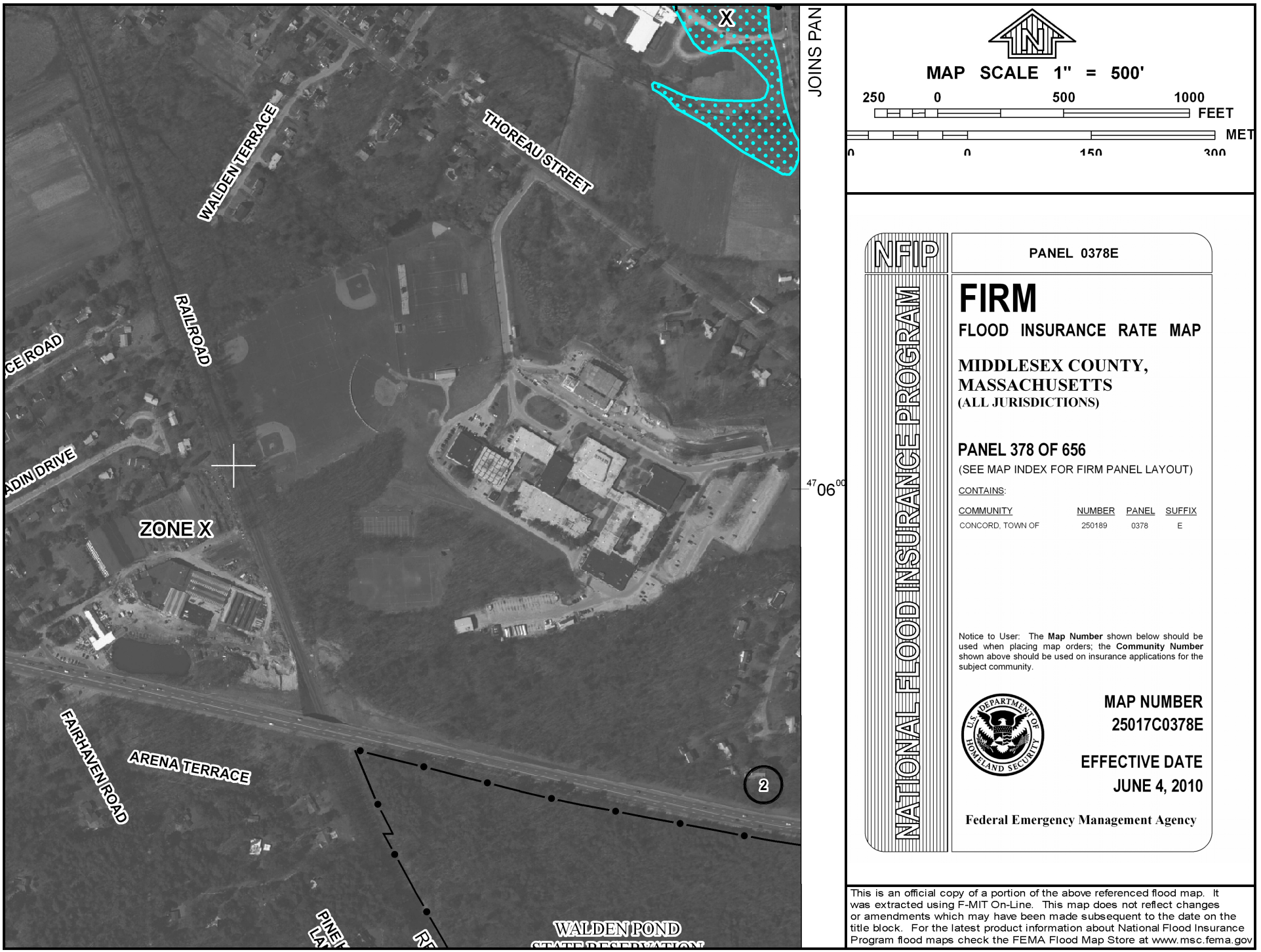
CONCORD-CARLISLE REGIONAL HIGH SCHOOL
CONCORD, MA

SOURCE: MassGIS Commonwealth of MA EOEEA

PROJECT NO.: 1234.00

N

FIGURE 6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THOREAU STREET
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ARENA TERRACE
2
WALDEN POND
MAP SCALE 1" = 500'
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FEET
MET
0 0 150 300
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0378E
FIRM
FLOOD INSURANCE RATE MAP
MIDDLESEX COUNTY, MASSACHUSETTS
(ALL JURISDICTIONS)
PANEL 378 OF 656
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
CONCORD, TOWN OF 250189 0378 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
25017C0378E
EFFECTIVE DATE
JUNE 4, 2010
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 7

APPENDIX B
Aerial Photographs


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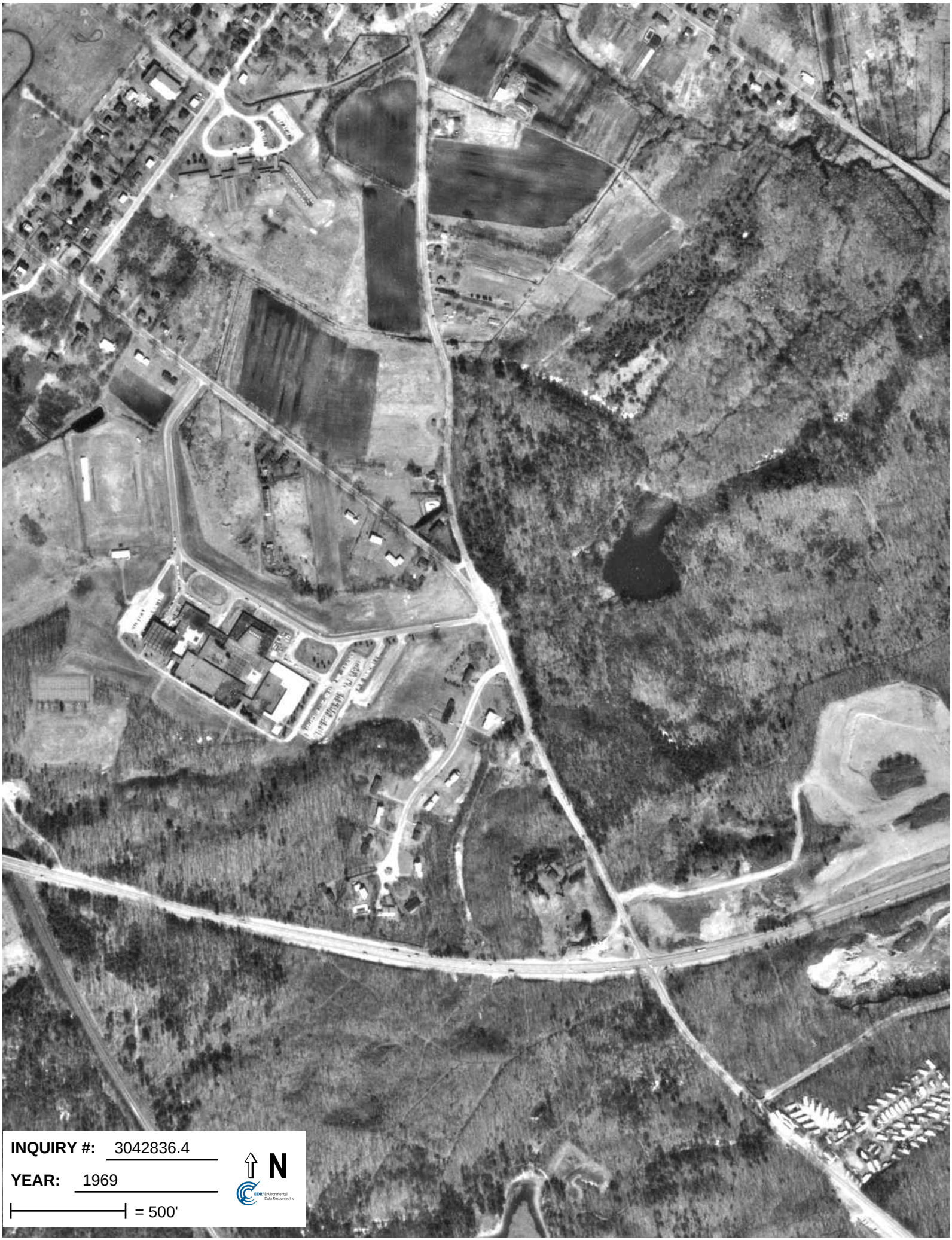
YEAR: 1952
= 250'
N
EDR Environmental Data Resources Inc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INQUIRY #: 3042836.4
YEAR: 1980
= 750'
N
EDR Environmental Data Resources Inc


INQUIRY #: 3042836.4
YEAR: 2006
= 604'
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EDR Environmental Data Resources Inc

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX C
Environmental Database Report Executive Summary

CDW CONSULTANTS, INC.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

500 WALDEN STREET
CONCORD, MA 01742

COORDINATES

Latitude (North):	42.448700 - 42° 26' 55.3''
Longitude (West):	71.342900 - 71° 20' 34.4''
Universal Tranverse Mercator:	Zone 19
UTM X (Meters):	307325.4
UTM Y (Meters):	4702042.0
Elevation:	154 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	42071-D3 CONCORD, MA
Most Recent Revision:	1987

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2006, 2008
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 7 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
CONCORD CARLISLE REGIONAL HIGH SC 500 WALDEN STREET CONCORD, MA 01742	FINDS	N/A
CONCORD CARLISLE REGIONAL SCHOOL 500 WALDEN STREET CONCORD, MA 01742	MANIFEST	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal leaking storage tank lists

LUST ---------- Leaking Underground Storage Tank Listing

LAST ---------- Leaking Aboveground Storage Tank Sites
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

AST ---------- Aboveground Storage Tank Database
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL ---------- Sites With Activity and Use Limitation

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ---------- Clandestine Drug Labs
US HIST CDL ---------- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---------- CERCLA Lien Information
LUCIS ---------- Land Use Control Information System

Records of Emergency Release Reports

HMIRS ---------- Hazardous Materials Information Reporting System
SPILLS ---------- Historical Spill List

Other Ascertainable Records

RCRA-NonGen ---------- RCRA - Non Generators
DOT OPS ---------- Incident and Accident Data
DOD ---------- Department of Defense Sites
FUDS ---------- Formerly Used Defense Sites
CONSENT ---------- Superfund (CERCLA) Consent Decrees
ROD ---------- Records Of Decision
UMTRA ---------- Uranium Mill Tailings Sites
MINES ---------- Mines Master Index File

TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
RAATS	RCRA Administrative Action Tracking System
NPDES	NPDES Permit Listing
DRYCLEANERS	Regulated Drycleaning Facilities
ENF	Enforcement Action Cases
AIRS	Permitted Facilities Listing
LEAD	Lead Inspection Database
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
FINANCIAL ASSURANCE	Financial Assurance Information Listing
GWDP	Ground Water Discharge Permits
COAL ASH DOE	Sleam-Electric Plan Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

SHWS: Contains information on releases of oil and hazardous materials that have been reported to DEP.

A review of the SHWS list, as provided by EDR, and dated 01/11/2011 has revealed that there are 10

SHWS sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
TUTTLES LIVERY	***35-45 WALDEN ST***	***NNW 1/2 - 1 (0.800 mi.)***	***9***	***33***
Compliance Status: No Further Action (DEP Determined)				
NO LOCATION AID	***1089 CONCORD TPKE***	***W 1/2 - 1 (0.804 mi.)***	***B10***	***34***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
CONCORD SUNOCO	***1089 CONCORD TURNPIKE***	***W 1/2 - 1 (0.804 mi.)***	***B11***	***40***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***41 MAIN ST REAR***	***NNW 1/2 - 1 (0.837 mi.)***	***12***	***61***
Compliance Status: Release Action Outcome				
PROPERTY	***211 SUDBURY RD***	***WNW 1/2 - 1 (0.850 mi.)***	***14***	***67***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
MILL BROOK	***34 MAIN ST (NEAR)***	***NNW 1/2 - 1 (0.859 mi.)***	***15***	***77***
Compliance Status: Release Action Outcome				
STATION 2169 CUMBERLAND FARMS	***120 THOREAU ST***	***NW 1/2 - 1 (0.887 mi.)***	***C16***	***79***
Compliance Status: Release Action Outcome				
Compliance Status: Release Action Outcome				
**Additional key fields are available in the Map Findings section*				
BEHIND COLONIAL INN	***48 MONUMENT SQ***	***NNW 1/2 - 1 (0.938 mi.)***	***18***	***90***
Compliance Status: Release Action Outcome				
NO LOCATION AID	***50 BELKNAP ST***	***NW 1/2 - 1 (0.962 mi.)***	***D19***	***93***
Compliance Status: Response Action Outcome Not Required				
SERVICE STATION FMR	***48 THOREAU ST***	***NW 1/2 - 1 (0.992 mi.)***	***21***	***109***
Compliance Status: Release Action Outcome				

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Department of Environmental Protection's Solid Waste Facility Database/Transfer Stations.

A review of the SWF/LF list, as provided by EDR, and dated 01/03/2011 has revealed that there is 1 SWF/LF site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CONCORD LANDFILL	755 WALDEN ST	SSE 1/4 - 1/2 (0.468 mi.)	4	9

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Protection's Summary Listing of all the Tanks Registered in the State of Massachusetts.

A review of the UST list, as provided by EDR, and dated 03/04/2011 has revealed that there is 1 UST

site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CONCORD-CARLISLE REGIONAL SCHO	*300 WALDEN ST*	*N 1/8 - 1/4 (0.230 mi.)*	*3*	*9*

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

RELEASE: MA Release Tracking Database.

A review of the RELEASE list, as provided by EDR, and dated 01/11/2011 has revealed that there are 17 RELEASE sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CONCORD FIRE DEPARTMENT Facility Status: Response Action Outcome	*209 WALDEN ST*	*N 1/2 - 1 (0.548 mi.)*	*5*	*10*
Not reported Facility Status: Response Action Outcome	*105 EVERETT ST*	*NW 1/2 - 1 (0.552 mi.)*	*6*	*15*
NYNEX COMMUNICATIONS OFFICE Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*111 WALDEN ST*	*NNW 1/2 - 1 (0.683 mi.)*	*7*	*19*
NO LOCATION AID Facility Status: Response Action Outcome	*148-150 HUBBARD ST*	*NW 1/2 - 1 (0.707 mi.)*	*8*	*27*
TUTTLES LIVERY Facility Status: DEP No Further Action	*35-45 WALDEN ST*	*NNW 1/2 - 1 (0.800 mi.)*	*9*	*33*
NO LOCATION AID Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*1089 CONCORD TPKE*	*W 1/2 - 1 (0.804 mi.)*	*B10*	*34*
CONCORD SUNOCO Facility Status: Response Action Outcome	*1089 CONCORD TURNPIKE*	*W 1/2 - 1 (0.804 mi.)*	*B11*	*40*
NO LOCATION AID Facility Status: Response Action Outcome	*41 MAIN ST REAR*	*NNW 1/2 - 1 (0.837 mi.)*	*12*	*61*
MOBIL STATION	*143 SUDBURY ST*	*NW 1/2 - 1 (0.840 mi.)*	*13*	*65*
PROPERTY Facility Status: Response Action Outcome Facility Status: Response Action Outcome **Additional key fields are available in the Map Findings section*	*211 SUDBURY RD*	*WNW 1/2 - 1 (0.850 mi.)*	*14*	*67*
MILL BROOK Facility Status: Response Action Outcome	*34 MAIN ST (NEAR)*	*NNW 1/2 - 1 (0.859 mi.)*	*15*	*77*
STATION 2169 CUMBERLAND FARMS Facility Status: Response Action Outcome Facility Status: Response Action Outcome	*120 THOREAU ST*	*NW 1/2 - 1 (0.887 mi.)*	*C16*	*79*
NO LOCATION AID Facility Status: Response Action Outcome	*120 THOREAU ST*	*NW 1/2 - 1 (0.887 mi.)*	*C17*	*85*
BEHIND COLONIAL INN Facility Status: Response Action Outcome	*48 MONUMENT SQ*	*NNW 1/2 - 1 (0.938 mi.)*	*18*	*90*
NO LOCATION AID Facility Status: Response Action Outcome Not Required	*50 BELKNAP ST*	*NW 1/2 - 1 (0.962 mi.)*	*D19*	*93*

EXECUTIVE SUMMARY

Lower Elevation	Address	Direction / Distance	Map ID	Page
MAIN STREET	***50 BELKNAP ST***	***NW 1/2 - 1 (0.962 mi.)***	***D20***	***101***
Facility Status: Response Action Outcome				
SERVICE STATION FMR	***48 THOREAU ST***	***NW 1/2 - 1 (0.992 mi.)***	***21***	***109***
Facility Status: Response Action Outcome				

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
CONCORD MIDDLE SCHOOL SANBORN BLDG	FTTS,HIST FTTS INSP,FINDS
FACILITY #62	HWS,RELEASE
CROSBY CORNER	HWS,RELEASE
ACROSS FROM STATE HWY GARAGE	HWS,RELEASE
MCI BUILDING F	HWS,RELEASE
HAYES PUMP SITE FMR	HWS,RELEASE
NEAR INTERSECTION WITH RTE 2 AND R	HWS,RELEASE
SITE 6 NEAR CONCORD LINE	HWS,RELEASE
SITE 3 BEHIND SMITH HOUSE	HWS,RELEASE
OLD SANITARY LANDFILL	HWS,RELEASE
LINCOLN TRANSFER STATION	LF
EXECUTIVE FLYERS AVIATION	INST CONTROL,RELEASE,LUST
TEXACO SERVICE STATION	RCRA-CESQG
LINCOLN SCHOOL	FINDS
LINCOLN SCHOOL DEPT	FINDS
CONCORD SANITARY LANDFILL	ODI
SWANSON PONTIAC	MANIFEST
CONCORD SUBARU	MANIFEST
CONCORD SUBARY	MANIFEST
WALDEN POND STATE RESERVATION	MANIFEST

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX D

Excerpts from “Report on Removal of Underground Storage Tanks”

CDW CONSULTANTS, INC.

GG
GEMINI GEOTECHNICAL ASSOCIATES, INC.
875 Greenland Road • Portsmouth, NH 03801 • (603) 427-0141

August 31, 1990
Project No. 89035MA

Concord Public Schools
Concord - Carlisle Regional School District
120 Meriam Road
Concord, Massachusetts 01742

Attn: Dr. Gerald E. Missal

Re: Report on Removal of Underground Storage Tanks
Concord Public Schools and Concord - Carlisle Regional High School
Concord, Massachusetts

Dear Dr. Missal:

In accordance with your approval of our proposal GGA89.127.0, dated September 19, 1989, Gemini Geotechnical Associates, Inc. has performed engineering design services and environmental review for the removal of thirteen underground storage tanks in the Town of Concord during 1990. These tanks include :

Facility	Size	Installed	Fuel
Alcott School	5,000 gal.	1951	No. 2
Alcott School	8,000 gal.	1955	No. 2
Willard School	10,000 gal.	1958	No. 4
Willard School	500 gal.	1965	No. 4
Sanborn School	10,000 gal.	1966	No. 4
Peabody School	10,000 gal.	1970	No. 4
Thoreau School	5,000 gal.	1951	No. 2
Thoreau School	5,000 gal.	1955	No. 2
Concord - Carlisle High School	15,000 gal.	1960	No. 4
Concord - Carlisle High School	15,000 gal.	1965	No. 4
Concord - Carlisle High School	10,000 gal.	1960	No. 4
Ripley Administration Building	10,000 gal.	1958	No. 2
Ripley Administration Building	500 gal.	1969	No. 2

The tanks were removed by Zenone, Inc. of Leominster, Massachusetts between July 10 and July 19, 1990. All removals were monitored by Gemini Geotechnical Associates, Inc., who retrieved samples for laboratory testing and screened soils for volatile organic compounds during the excavation.

Description of Sites

A site location plan is attached as Figure 1. The schools are located as follows:

School	Street	Coordinates
Alcott School	Laurel Lane	42°27'14"N, 71°20'53"E
Willard School	Powder Mill Road	42°25'47"N, 71°22'55"E
Sanborn School	Marlboro Road	42°26'30"N, 71°23'39"E
Peabody School	Old Marlboro Road	42°26'01"N, 71°24'14"E
Thoreau School	Prairie Street	42°27'07"N, 71°23'49"E
Concord - Carlisle High School	Thoreau Street	42°26'51"N, 71°20'42"E
Ripley Administration Building	Meriam Road	42°27'53"N, 71°19'53"E

There are five public drinking water wells in Concord. Four of these wells, the Hugh Cargiol Well, the White Pond Well, the Jennie Dugan Well, and the Second Division Well, are located within 1 mile of schools where the tank removals took place. The Hugh Cargiol Well, located near the intersection of Thoreau and Walden Streets, is approximately one quarter of a mile east of the Concord - Carlisle High School. The White Pond Well is located in the Dover Street area, just south of White Pond, and is located approximately one quarter of a mile southwest of the Willard School. The Jennie Dugan Well, located on Old Marlboro Road, is within one-half mile east of the Peabody School and within one-half mile southwest of the Sanborn School. The Second Division Well, which is located in the area of Border Road in West Concord, is approximately three quarters of a mile northwest of the Peabody School.

Tank Excavation and Removal

General

The finished tank excavation areas and the excavated soils were inspected and screened for total volatile organic compounds (VOC's) with a portable Organic Vapor Meter (OVM). The OVM is used to measure concentrations of total volatile

organic compounds in air, which include benzene, toluene and xylenes which are compounds contained in gasoline and petroleum products. The air in the headspace of soil samples is continuously fed into the OVM by a positive displacement pump, and is introduced into a high energy ultraviolet photoionization detector, where a small portion of the sample is ionized. The amount of ions reaching the electrode is proportional to the concentration of organic molecules. The OVM 580A is manufactured by Thermo Environmental Instruments, Inc. of Franklin, MA, and has a detection limit of 0.1 parts per million. Soils were tested by analyzing the air from the head space developed in jar soil samples, and also by screening the soils in-situ.

Alcott Elementary School

Two underground storage tanks, with storage capacities of 5,000 and 8,000 gallons, were removed at the Alcott School on July 10, 1990 by Zenone, Inc. of Leominster, Massachusetts. The 5,000 gallon tank, referred herein as Tank #1, was located on the north side of the school, approximately 15 ft. south of the boiler room, aligned north to south. The 8,000 gallon tank, referred to as Tank #2, was located approximately 20 ft. north and 50 ft. west of Tank #1, and was aligned east to west. Photographs of the site are included in Appendix A.

The soils within the area excavated during removal of the 5,000 gallon tank consisted of a cobbley and bouldery sand, which was mostly fine and contained a fairly high silt content. Soils from the excavation were visibly stained with petroleum product and exhibited an odor characteristic to petroleum products. Excavated soils and soils at the bottom of the excavation were sampled in glass jars and screened for VOCs with the portable OVM. Results of the screenings ranged from non-detectable to concentrations up to 42.8 ppm.

The 5,000 gallon tank excavation was approximately 30 ft. long and 10 ft. deep. Groundwater was encountered at 8 ft. below the surface grade. The most contaminated soils were located under the tank where the fill pipe end of the tank had been located. Upon removal, the tank was somewhat rusted and pitted, but no holes were obvious. Laboratory analysis of the soils remaining in the excavation following the removal of the three loads of heavily contaminated soils revealed a petroleum hydrocarbon concentration of 420 ppm for a soil sample obtained in the fill end area, and a petroleum hydrocarbon concentration of 85 ppm for soil samples obtained at the opposite end of the excavation. Laboratory results are included as Appendix B.

Mike Garrosi of the Massachusetts Department of Environmental Protection was contacted by telephone in regards to management of the contaminated soils. Mr.

Garrosi advised that only the most heavily contaminated soils be removed from the excavation and that the site be backfilled. Mr. Garrosi stated that the site would be reported to the Site Assessment Branch of the DEP and would be put on the Locations to be Investigated, or LTBI, list. Three loads of contaminated soils at a volume of 16 cu. yds. per load were removed from the excavation and transported to Town land near the Concord - Carlisle High School, where the soil was stockpiled using plastic sheeting to avoid contamination of the surrounding area.

Upon arrival at the Alcott School, it was discovered that the excavation made when the 8,000 gallon tank (Tank #2) was removed had already been backfilled prior to inspection and testing by Gemini Geotechnical Associates, Inc. Zenone, Inc. was asked to re-excavate the area so that the soils could be tested. The clean fill used to backfill the excavation was removed and brought to the Tank #1 excavation, from which contaminated soils had already been removed. The soils under the clean fill were found to contain contamination similar to that observed in the Tank #1 excavation, and "globules" of oil mixed with soil were observed throughout the re-excavated area of the Tank #2 excavation. One truckload (16 cu. yds.) of contaminated soils was removed and stockpiled at the high school.

The 8,000 gallon tank was rusted in spots, but no holes were evident in the tank. Samples taken during re-excavation were placed in glass jars and screened with the OVM. Volatile organic compound concentrations ranged from 48.6 to 63.0 ppm. Laboratory analysis for Total Petroleum Hydrocarbons indicated 1900 ppm of petroleum hydrocarbons in the vicinity of the fill pipe, 530 ppm near the fill end of the excavation, and 240 ppm at the opposite end of the excavation.

Willard Elementary School

Two underground No. 4 fuel oil storage tanks, with capacities of approximately 10,000 and 500 gallons, were removed at the Willard Elementary School on July 11, 1990. The 10,000 tank, referred herein as Tank #1, was located on the north side of the school, approximately 10 ft. east of the loading dock area, and was aligned north to south. The 500 gallon tank, referred to as Tank #2, was situated approximately 5 ft. north of the end of tank #1 and was aligned perpendicular to that tank. Photographs of the excavation area and the removed tanks are included in Appendix A.

Due to the close proximity the tanks, removal of the two tanks was performed within one large excavation. The area occupied by Tank #1 was approximately 35

ft. long and 15 ft. deep and the area occupied by Tank #2 was approximately 10 ft. long and 10 ft. deep. The removal of Tank #1 was complicated by underground utility wires and piping located to the top and north side of the tank, but the tank was eventually removed without incident. Tank #2 was found to contain some oil at the time of removal, and a small amount (1 - 5 gallons) was spilled onto the grass near the excavation at the time of removal. This small spill was promptly contained and removed by Zenone, Inc. personnel.

Soils around the tanks were collected in glass jars and screened with the OVM. Insitu OVM readings were also taken from soils surrounding the tank. Soils sampled from the sides of Tank #1 showed volatile organic compound concentrations ranging from 5.6 to 24.1 ppm. In-situ readings taken from a pile of soils which had been located on the west side of the tank ranged from 1 to 2 ppm. There was no visible discoloration of the soils excavated, nor in the excavation, and only a very slight petroleum odor could be detected. Laboratory analysis of soils which were directly underneath Tank #1 indicated that a Total Petroleum Hydrocarbon concentration of 74 ppm was detected in soils sampled under the end of the tank opposite the fill end. Soil samples obtained from underneath the fill end of the tank and underneath the middle of the tank were found to be below detection limits.

Upon excavation, Tank #2 was observed to be situated on a concrete base and surrounded by concrete walls. Soils under the concrete and soils in the area of the tank were sampled and screened with the OVM, and no volatile organics were detected. A laboratory analysis was performed on a single soil sample obtained from the bottom of this excavation. The results indicated that the Total Petroleum Hydrocarbon concentration level of the soils sampled was below detection limits.

Upon excavation, both tanks were found to be in good condition with some rusting and very little pitting. No holes were evident in either of the two tanks. The excavations were backfilled with the existing soils, which consisted of a brown, cobbley, mostly fine sand with a small amount of silt.

Sanborn Middle School

A 10,000 gallon underground No. 4 fuel oil storage tank was removed at the Sanborn Middle School on July 12, 1990. The tank was located approximately 20 ft. off the southwest wall of the school, near the southern corner of the building. The tank was aligned northwest to southeast. Soils at the site consisted of a mostly fine sand with some silt, and traces of gravel and cobbles. Photographs of the excavated area and the removed tank are included in Appendix A.

jars and screened with the OVM. VOC concentrations of 4.0 and 0.6 ppm were detected for these samples. In addition, three samples obtained from soils at the bottom of the excavation, and one sample composited from soils which had been removed from the sides of the tank, were collected and sent to the laboratory to be analyzed for Total Petroleum Hydrocarbons. Lab results indicated that a sample taken from soils under the middle section of the tank, as well as the soils sampled from the sides of the tank showed no detectable concentrations of petroleum hydrocarbons. Soils underneath the fill end of the tank exhibited a petroleum hydrocarbon concentration of 67 ppm; soils underneath the opposite end of the tank showed a petroleum hydrocarbon concentration of 66 ppm.

The excavation was backfilled with the soils which originally filled the excavation.

Thoreau Elementary School

Two 5,000 gallon underground #2 fuel oil tanks were removed at the Thoreau School on July 16, 1990. The tanks were located side by side approximately 5 ft. from the north wall of the building and were aligned north to south. Soils at the site consisted of a coarse to fine, but mostly fine, silty brown sand, which contained some gravel and cobbles.

A strong petroleum odor was noted in the vicinity of the excavation. Initially, no petroleum soaked soils were visible, but after removing soils at the bottom of the excavation, soils heavily soaked with petroleum were found to be situated below the level at which the tanks rested and above a concrete slab on which the tanks were installed. To the left of the excavation, where Tank #1 had been, soils closest to the building in the area of the tank's end were visibly stained with fuel oil.

An inspection of the two tanks following removal revealed oil stains on both tanks. Tank #1, located on the left when viewing the tanks from Prairie Street, was stained at the fill end, near the manhole; Tank #2, located to the right, was stained on the top center, surrounding the manhole. In addition, both tanks were rusted, although there was little to no pitting to the tanks. No holes were evident in the tanks.

In-situ OVM readings taken from soils which had surrounded the top and sides of the tanks ranged from nondetectable to 28.8 ppm. Samples of these soils were also collected in glass jars and screened with the OVM. These soil samples were found to contain VOC's at concentrations of 30.0, 53.3, and 30.0 ppm. In addition, jar soil samples were collected prior to removing the heavily contaminated soils for

stockpiling and sent to the lab to be analyzed for Total Petroleum Hydrocarbons. These samples indicate that contamination underneath the right tank was less extensive than contamination underneath the tank to the left. Laboratory results indicate a petroleum hydrocarbon concentration of 5000 ppm in the area of the piping into the school. A sample taken at the end opposite the fill end on the right tank was found to contain 220 ppm of petroleum hydrocarbons; a sample taken from the end of the tank closest to the fill was found to contain a concentration of hydrocarbons of 310 ppm. Lab results showed a petroleum hydrocarbon concentration of 350 ppm at the end of the left tank closest to the fill end, and a concentration of 4800 ppm at the opposite end of the tank (closest to the school). According to these results, and visual evidence, the heaviest contamination in the excavation was in the soils closest to the building. It should be noted however, that these lab results reflect the petroleum content of the original soils in the excavation, prior to removal of contaminated soils. The petroleum content of the soils which remain in the excavation may be lower than levels indicated here.

Mike Garrosi of the Massachusetts Department of Environmental Protection was notified of the contamination at the site. Mr. Garrosi stated that the most heavily contaminated soils should be removed and that a site assessment would most likely be required at the site at a later date. Three loads, totalling 48 cu. yds., of the most heavily contaminated soils were removed from the excavation. The excavation was then backfilled with other soils from the excavation as well as off-site loads of fresh fill. The contaminated soils were transported to Town land located near the High School and stockpiled using plastic sheeting.

Concord - Carlisle High School

Two 15,000 gallon and one 10,000 gallon underground storage tanks were removed from the Concord - Carlisle High School on July 17 and July 18, 1990. All three tanks had contained #4 fuel oil. Photographs of the tanks and the excavations are included in Appendix A.

A 15,000 gallon tank located partially under a walkway near the High School Gym was removed on July 17, 1990. The tank was aligned northeast to southwest and extended out from the northeast side of the gymnasium. The tank removal was complicated by the location of the tank. During excavation, it was discovered that the tank extended approximately 6 ft. under an addition to the building subsequent to the tank installation. The addition, which is a walkway to the gymnasium, has a concrete base, and while the tank was not supporting any part of the addition, the concrete base was situated directly over the tank. Concrete support piles located on either side of the tank transferred the wall load to the soils below the tank. At the

completion of the removal, the excavation was approximately 20 x 20 ft. sq. and ten feet deep, as a result of the large amount of soils excavated around the tank in order to facilitate the tank removal.

The tank was eventually removed from the excavation with no apparent structural damage to the surrounding building. No visible or obvious evidence of a petroleum release was noted in the excavation. In-situ OVM readings of soils taken from the top and sides of the tank showed no presence of volatile organic compounds. Soil samples taken from the bottom of the excavation were placed in glass jars and screened with the OVM. These samples were found to have no detectable concentrations of VOC's. Samples analyzed in the lab showed a Total Petroleum Hydrocarbon concentration of 380 ppm for an area at the bottom of the tank between the middle of the tank and the fill end. A sample taken near the opposite end of the tank, near where the tank had extended under the building was below detection limits, and a sample taken from soils which had surrounded the sides of the tank showed a petroleum hydrocarbon concentration of 60 ppm. The tank itself was found to be slightly rusted and pitted, with no holes or staining, with the exception of a crack made near the fill end of the tank during excavation.

The 15,000 gallon tank at the Science Building was removed on July 18, 1990. The tank was located outside the southeast wall of the Science Building, and was situated perpendicular to the building wall. Soils in the vicinity of this tank consisted of a dry, light brown gravelly and cobbley sand. Upon removal of the tank, the soils appeared clean, with no free product or groundwater present. The excavation was approximately 12 ft. deep. The tank was found to be in good shape with no excessive rusting or pitting observed. No holes were found in the tank, with the exception of one hole which was made during excavation.

The soils were screened for volatile organic compounds using the OVM. Soils which had been removed from the excavation were screened in-situ, and eight readings of no VOC detection were obtained, as well of readings of 4.1 ppm, 6.3 ppm, and 7.1 ppm. Four samples were collected from the bottom of the excavation and placed in glass jars. These readings obtained from these samples included one reading below detection limits, a reading of 0.7 ppm, a reading of 3.0 ppm, and a reading of 30.1 ppm, which was obtained from a sample taken near the fill end of the tank. Mike Garrosi, of the Massachusetts Department of Environmental Protection was telephoned and notified of this last, elevated reading. Two samples from the bottom of this excavation were collected and sent to the laboratory for analysis. The samples, taken from soils under each end of the tank, were reported to have concentrations of petroleum hydrocarbons below detection limits.

No soils were removed for stockpile, and the excavation was backfilled with the original soils.

The 10,000 gallon tank at the Arts Building was removed on July 18, 1990. The tank was located on the northeast side of the school, and was situated parallel to the wall of the building. The soils in the area were observed to be dry, light brown, gravelly sand.

The final excavation was 15 ft. wide and 9 ft. deep. No free product or groundwater was encountered during the excavation. Upon removal, the tank was found to be in good condition with no evidence of holes or excessive rusting or pitting. Samples taken from the bottom of the excavation and placed in glass jars were screened with the OVM. Concentrations of volatile organic compounds ranged from non-detectable to 2.7 ppm. These samples were also tested in the laboratory for Total Petroleum Hydrocarbon concentrations. The lab results indicate that these samples, taken from each end of the tank, as well as from the middle of the tank, contain concentrations of petroleum hydrocarbons which are below detection limits. The excavation was backfilled with the original soil material.

Ripley Administration Building

Two underground #2 fuel oil storage tanks, one 10,000 gallons and one 500 gallons, were removed at the Ripley Administration Building on July 19, 1990. The tanks were located on the north side of the school building, perpendicular to the building. The tanks were aligned end to end, with the 10,000 gallon tank closest to the school. Both of the tanks were on top of concrete slabs.

During excavation, groundwater was encountered at approximately 6 to 8 ft. The natural soils in the area were observed to be a fine tan sand, and the fill that had been used to cover the tanks was a medium to coarse sand. No free product or oily soils were observed in the excavation. The soils were monitored with the OVM and only slight values of volatile organic compounds (less than 10 ppm) were found in an area on the north side of the excavation, under the fill and next to the slab for the 500 gallon tank. The tanks were difficult to extricate due to the groundwater, which caused a suction force on the tank.

Jar soil samples were taken from soils located underneath the two tanks, and were tested in the laboratory for Total Petroleum Hydrocarbons. The results of laboratory testing indicates that no detectable amounts of petroleum hydrocarbons

were found for soils under each end of the 10,000 gallon tank, but that a petroleum hydrocarbon concentration of 210 ppm was detected for soils sampled from underneath the 500 gallon tank.

Upon excavation the tanks were found to be rusted (the 500 gallon tank more so than the 10,000 gallon tank), but there were no holes or evidence of leakage, with the exception one hole which was made in the 10,000 gallon tank during removal.

Conclusions

Based on the data presented in this report, it is our professional opinion that the tanks were satisfactorily removed in compliance with all applicable local and state laws. Contaminated soils were encountered at two sites, the Alcott and Thoreau Schools. The extent of contamination is expected to be limited because it appears that the release of oil at both sites had occurred as a result of spillage or overfilling. The tanks at the Thoreau School had been set on a concrete slab, which would limit the extent of migration of contaminants. A total of 96 cu. yds. of contaminated soil was removed from the sites and stockpiled for disposal.

The Massachusetts DEP was notified of the contamination in accordance with DEP requirements. In accordance with the Massachusetts Contingency Plan, 310 CMR 40.00 the Alcott and Thoreau schools will be listed as Locations To Be Investigated (LTBI). Additional field investigations may be required by the DEP upon the review of the data presented in this report.

Very truly yours,
GEMINI GEOTECHNICAL ASSOCIATES, INC.

Lisa M. Morgan

Lisa M. Morgan
Environmental Geologist

Frank S. Vetere, P.E., Principal
Director of Technical Services

COMMONWEALTH OF MASSACHUSETTS
FRANK S. VETERE
No. 29834
REGISTERED PROFESSIONAL ENGINEER

FSV:LMM:lm
Attachments

Concord Carlisle High School
Concord, MA
CDW Project #1234

APPENDIX E

EXCERPTS FROM HISTORICAL REPORT:
"History of the Concord-Carlisle Regional High School Woods"
2007

CDW CONSULTANTS, INC.

...short, "Cut Woods" in his Journal entries of June 21 and 23, 1854, May ... and October 14, 1856, and October 22, 1860, later published as part of his ...e Journals first in 1906. This area was critical to the formulation of his ideas on ...est succession presented in The Succession of Forest Trees lecture and essay and in Dispersion of Seeds (published much later as Faith In A Seed).

In 1887 several leading citizens of Concord recognized the beauty of this woods when they had the four acre parcel of land recently donated to the town by the heirs of Ralph Waldo Emerson for a public playground, drill ground, and ceremonial site landscaped so as to frame it as a "distant view" from the playground. That parcel is still part of Emerson Playground, but the original "distant view" of this fringe of Walden Woods has since been obscured by the construction of houses and growth of trees.

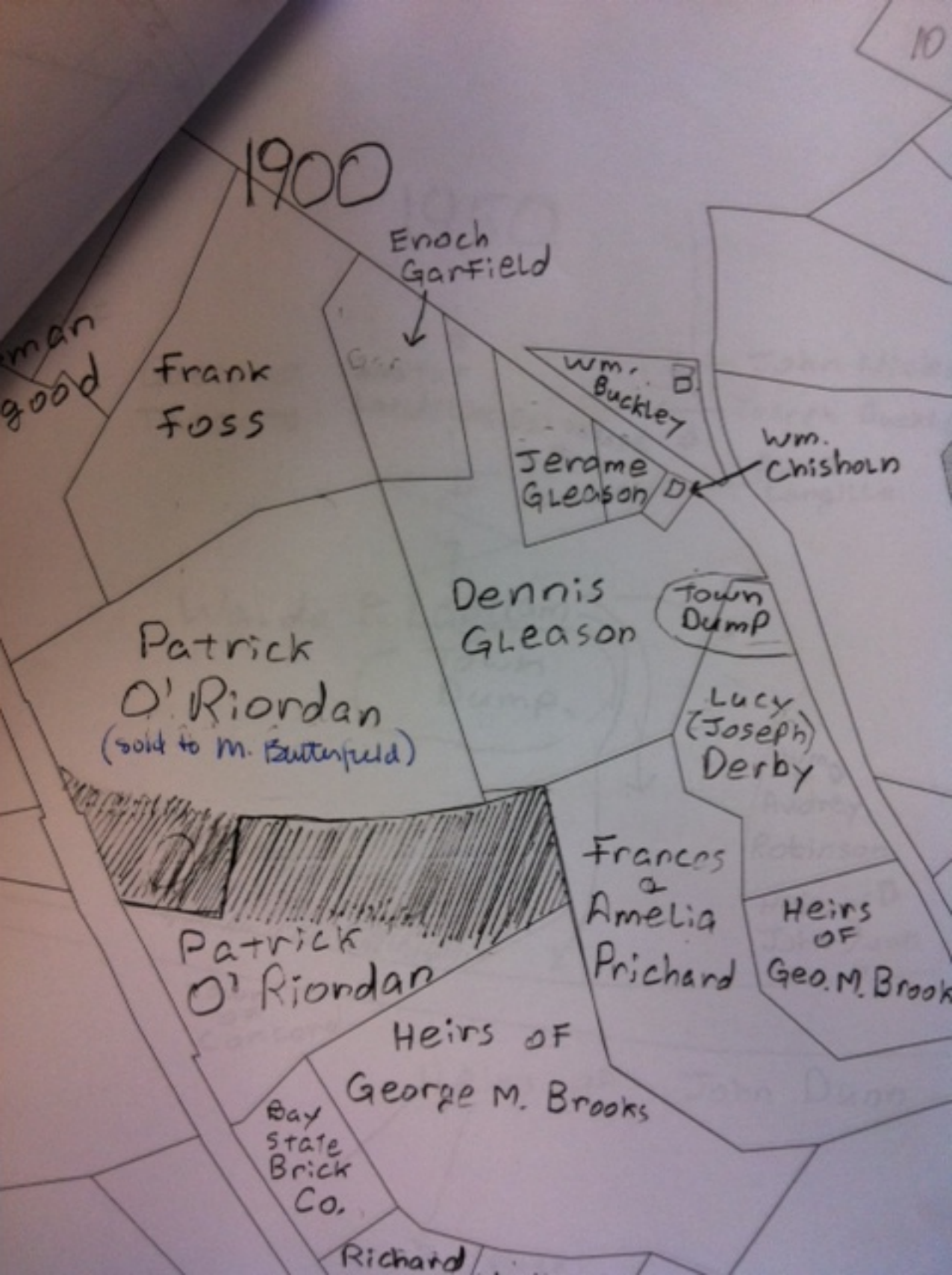
The Concord Turnpike (Route 2) was constructed in 1934 over this hill. It had been supported and lobbied for by most Concordians as it would take major through traffic away from the center of town. It generally followed the route of the old Cambridge – Concord Turnpike west to Crosby Corner, turned southwest up the hill and proceeded northwest through Deep Cut Woods. Most landowners along Route 2 wanted the town to re-zone their land so they could capitalize on the substantial traffic coming through. The selectmen realized they could not let everyone put a business, tearoom, or roadside stand on their land along the highway and, although they considered a number of different propositions (including a buyer who wanted to put a restaurant here), they decided, meeting with the selectmen of other towns along Route 2 in this area, to keep the highway corridor free from business development with the exception of filling stations at intervals and a few local produce stands. H.Whittemore Brown, president of Concord's Board of Trade and a selectman, and fellow selectman Edward Caiger, were instrumental in implementing this decision, which was referred to as the "Gentleman's Agreement" and which remained in effect into the 1960s. Concord's planning board concurred. In 1935 the town purchased the present Town Forest and on March 8, 1943 voted to sell the portion of the Butterfield lot north of the highway (containing all but about 4 acres of it) to West Concord real estate dealer Waldo Lapham – 35.07 acres for $1200 (Middlesex County South deed book 6746 page 545, 2/29/1944). Lapham had owned other land in this area (the eastern portion of the current high school lot) since the mid 1920s and carried out a gravel-removing operation here. The town dump was on his land, for which he started charging the town a rental fee from about 1950. He bought other land in this area as well and was planning a shopping center and a residential development for the future.

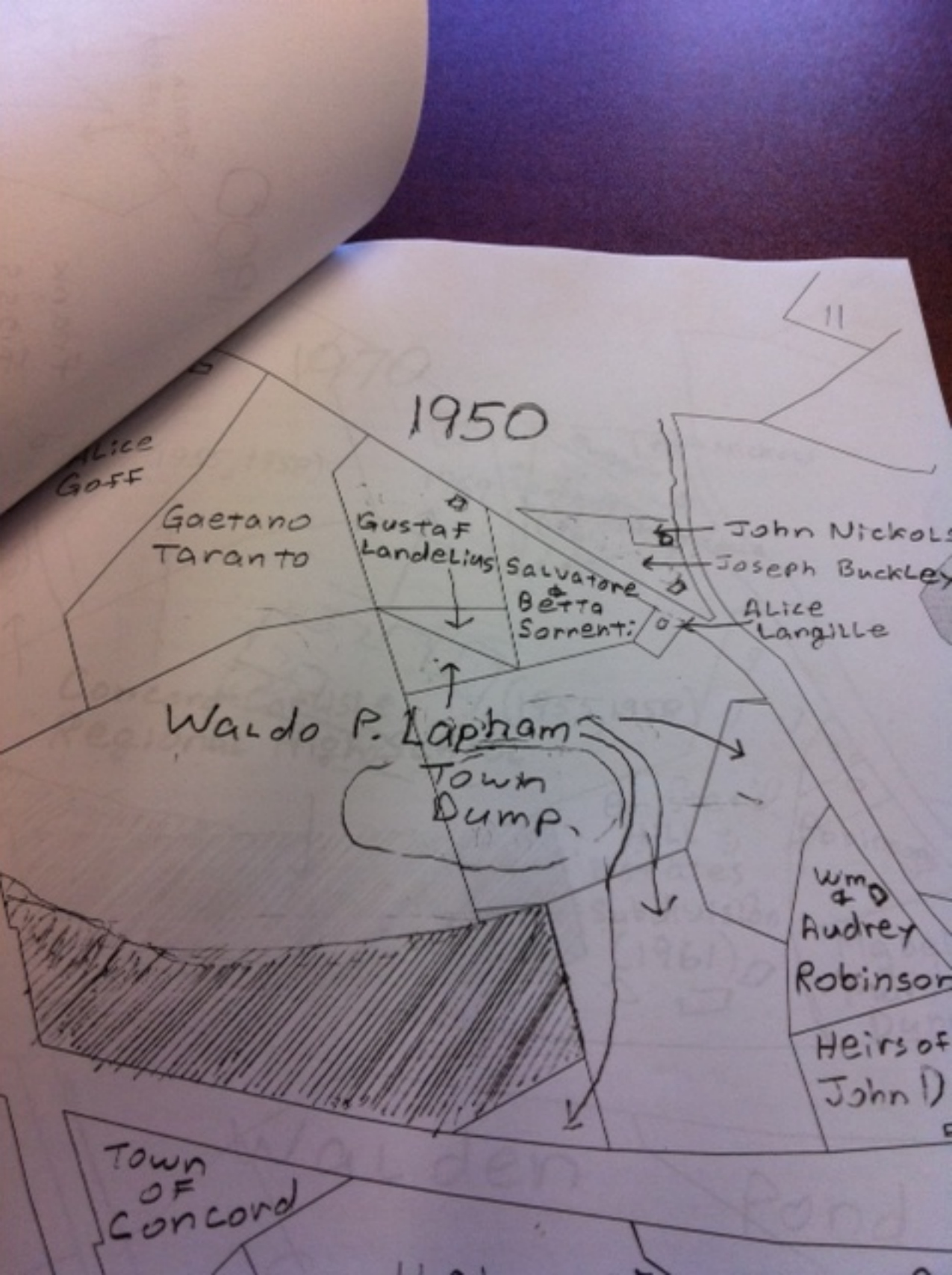
With the significant growth of the town following World War Two it became necessary to build a new high school and after consideration of a number of sites it was decided to build it here. So the town took the land they had let go over a decade earlier, as well as other land owned by Lapham and others to the east and north in November 1955. 56.3 acres were taken from Lapham as smaller amounts from Gaetano Taranto and Theodore and Reed Beharrell (the former holdings of the last two owners now constitutes much of the current playing fields) (M. Cty. South deed book 8637 page 308, 12/6/1955, Taking under the state legislature's Chapter 566 of the Acts of 1955 (under Ch. 79 of the state's General Laws)). The final settlement, in 1957, cost the I believe upwards of $60,000 (see deed Lapham to Town of Concord, Middlesex County South deed book 8997 pg. 108,

7/19/1957 and 8959 pg 522 of 5/28/1957). Concord conveyed the taken land to the Concord-Carlisle Regional School District on 8/18/1958 (bk 9229 pg 160). The new high school was constructed 1958 to 1960 and opened in September of that year. During this construction a small part on the north edge of Deep Cut Woods leveled to create athletic fields. The wooded portion behind the new school was left intact to buffer the school from the noise, fumes, and danger of Route 2. The high school's athletic department laid out a cross country running course through the woods which has been in use since then. School classes and environmental and nature clubs led by football coach Al Robichaud used the High School Woods as a laboratory for study and it soon became a "hangout" for students.

Lapham (and his heirs, as he died in 1960) were allowed to retain several acres in this area which became the Bristers Hill Road housing subdivision of 1961. Homes on this road were built between 1961 and 1964. The new residents and their successors quickly adopted these woods as their own, holding them in high esteem for their aesthetic as well as recreational values.

This brief history of the High School Woods has been assembled to


1900
Enoch Garfield
Frank Foss
Wm. Buckley
Jerome Gleason
Wm. Chisholm
Dennis Gleason
Town Dump
Patrick O'Riordan
(sold to M. Butterfield)
Lucy (Joseph) Derby
Frances & Amelia Prichard
Heirs of Geo. M. Brook
Patrick O'Riordan
Heirs of George M. Brooks
Bay State Brick Co.
Richard


11
1950
Alice Goff
Gaetano Taranto
Gustaf Landelius
Salvatore & Betta Sorrenti
John Nickols
Joseph Buckley
Alice Langille
Waldo P. Lapham
Town Dump
Wm & D Audrey Robinson
Heirs of John D
Town OF Concord